

CLAIMS:

1. A network routing apparatus for determining a routing address of a packet in a network on the basis of header information of said packet and routing said packet to said routing address, comprising:

a plurality of packet forwarding units for performing a process of forwarding input packets;

a packet distribution unit for distributing input packets supplied from an interface of a router into said packet forwarding units in order or into empty ones of said packet forwarding units which do not now perform processing; and

a packet rearrangement unit for performing rearrangement of packets in inputting order of the packets which are subjected to said packet forwarding process by said packet forwarding units.

2. A network routing apparatus according to Claim 1, wherein said packet distributing unit determines one of said packet forwarding units for distributing a packet on the basis of a header condition of said packet so that a series of packets to be forwarded from a packet sender address to a forwarding address are not arranged in reversed order even in a case where said packets are not rearranged by said packet rearrangement unit.

3. A network routing apparatus according to Claim 1, wherein:

said packets are sequentially numbered by

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said packet distribution unit when said packets are distributed to said packet forwarding units by said packet distribution unit;

said packet forwarding units retain said packets with said packet sequence numbers while said packet forwarding units perform said packet forwarding process; and

said packet rearrangement unit rearranges said packets in the order of said packet sequence numbers.

4. A network routing apparatus according to Claim 1, further comprising:

a first queue waiting for start of said packet forwarding process after packet distribution by said packet distribution unit; and

a second queue waiting for rearrangement of said packets by said packet rearrangement unit after completion of packet processing by said packet forwarding units.

5. A network routing apparatus according to Claim 1, further comprising:

a first counter for counting the number of packets or bytes in packets subjected to said packet forwarding process by each of said packet forwarding units, wherein said network routing apparatus obtains statistically the number of packets or bytes subjected to said packet forwarding process by tabulating the number of packets or bytes picked up in each of said

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packet forwarding units.

6. A network routing apparatus for determining a routing address of a packet in a network on the basis of header information of said packet and routing said packet to said routing address, comprising:

a plurality of packet forwarding units for performing a process of forwarding input packets; each of said packet forwarding units including:

a packet header operating mechanism for extracting a header of a packet and rewriting said header;

a plurality of packet retrieving units for performing packet header retrieval while said packet header extracted by said packet header operating mechanism is used as a key;

a retrieval packet distribution mechanism for distributing packet headers to said plurality of packet retrieving units; and

a retrieval packet rearrangement unit for rearranging packet header retrieval results supplied from said plurality of packet retrieving units.

7. A network routing apparatus according to Claim 6, wherein said retrieval packet distribution mechanism distributes packet headers to said packet retrieving units in order or to empty ones of said packet retrieving units which do not now perform processing.

8. A network routing apparatus according to

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Claim 6, wherein said retrieval packet distribution mechanism determines a packet retrieving unit used for distribution of packets on the basis of header conditions of said packets so that the order of said packets is not reversed among a series of packets to be forwarded from a packet sender address to a forwarding address even when said packets are not rearranged by said retrieval packet rearrangement unit.

9. A network routing apparatus according to Claim 6, wherein:

said packet headers are numbered in sequence by said retrieval packet distribution unit when said packet headers are distributed to said packet retrieving units by said retrieval packet distribution unit;

said packet retrieving units retain said packet headers with said packet header sequence numbers while said packet retrieving units perform said packet header retrieving process; and

said retrieval packet rearrangement unit rearranges retrieval results in the order of said packet header sequence numbers.

10. A network routing apparatus according to Claim 6, further comprising:

a first queue waiting for start of said packet header retrieving process after distribution of said packet headers by said retrieval packet distribution unit; and

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a second queue waiting for rearrangement of retrieval results by said retrieval packet rearrangement unit after completion of said packet header retrieving process in said packet retrieving units.

11. A network routing apparatus according to Claim 6, further comprising a first counter for counting the number of packets or bytes in packets subjected to said retrieving process in each of said packet retrieving units, wherein said network routing apparatus obtains statistically the number of packets or bytes subjected to said retrieving process by tabulating the number of packets or bytes picked up in each of said packet retrieving units.

12. A network routing apparatus according to Claim 6, wherein:

said packet retrieving units classify packets on the basis of header conditions of said packets and outputting numbers specifying results of the classification as retrieval results;

said retrieval packet rearrangement unit measures packet transfer rates in accordance with said numbers specifying said classification results of said packets received from said packet retrieving units; and

when a quantity of input packets exceeds a predetermined value, a process of aborting packets, a process of aborting packets easily at the time of traffic congestion or a process of suppressing an

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output rate of the packets to prevent the output rate of the packets from exceeding a predetermined value is executed in accordance with results of said measurement.

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